

Norton takes acid rain battle to U.S. Senate

On Canada Day — July 1, 1981 — Ontario Environment Minister Keith C. Norton took Ontario's campaign against transboundary air pollution and acid rain to a committee of the U.S. Senate in a special presentation in Albany, N.Y.

The presentation was made at an oversight hearing of the U.S. Senate's Committee on Environment and Public Works. Norton was supported by members of Environment Ontario's scientific team. Drs. Gregg Van Volkenburg and T.G. Brydges presented technical briefs outlining Ontario's

position on acid rain to the committee under Senator Daniel Moynihan and Congressman James Shuster.

Norton also announced that Ontario has increased its current budget to \$7 million to expand the ongoing acid rain scientific and experimental programs spearheaded by Environment Ontario. A portion of the increase of approximately \$1 million is required to support Ontario's efforts to persuade U.S. administrators and environmental officials to consider the transboundary and long-term factors involved in air borne

pollution and the threat of acid rain to the environment shared by the two countries.

Ontario has taken five legal initiatives in the United States in connection with the acid rain issue.

On March 12, Ontario asked the U.S. Environmental Protection Agency to disapprove requests from six states to permit 18 coal-fired plants to increase their emissions of sulphur and nitrogen oxides into the common airshed of both countries.

On March 30, Ontario expanded its intervention to add two large

(continued on pg. 2)



(photo: Tessa Buchanan)

ENVIRONMENT ONTARIO LEGACY

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Scott: Ontario will not run dry

The alarmist interpretation placed on the study "Water: the Emerging Crisis in Canada" by the popular press is unacceptable, Environment Ontario Deputy Minister Graham W.S. Scott told the annual conference of the Ontario Municipal Water Works Association in London, Ontario.

"We are not taking for granted nature's bountiful blessing. We welcome any constructive criticism, but we reject outright the implication that we're sifting back, fat and happy, while our great natural resource dwindles from beyond our control," Scott said.

The study, written by two geographers at the University of Victoria, was published by the Canadian Institute for Economic Policy. It came to the conclusion that Canadians are playing fast and loose with their enormous fresh water resources, and that Americans may, one day, grab part of what is left.

"Ontario has one of the most enlightened approaches to environmental protection in the

world, and the ministry enjoys world recognition. That recognition was earned, over many years, by a team of environmental professionals," Scott said.

Ministry studies of streamflow and water uses give no cause for alarm. The information on consumptive use indicates that there will not be a water shortage in the Ontario portion of the Great Lakes basin.

In 1957 the Government of Ontario established the Ontario Water Resources Commission as the first agency of its kind in the world. Its mandate was to guarantee a good supply of drinking water anywhere in the province and to keep rivers, lakes and ground water free of pollution.

In 1972, this mandate was taken over by the Ministry of the Environment.

"We have come a very long way. The Ministry of the Environment has constructed and operates more than 400 water and sewage systems serving some 300 municipalities at a cost of more than \$4 billion; \$1.2 billion of this amount was provided by the ministry. In addition, the ministry has provided \$300 million in grants to smaller communities for water and sewage services," Scott said.

The ministry now owns and operates about one-third of the water and sewage treatment plants in Ontario.

Municipal water services are now provided to 98 per cent of Ontario's urban population and communal sewage systems serve 94 per cent of urban residents.

All of us know that the Great Lakes do not represent an infinite source of fresh-water supply. The Great Lakes react, as do lesser reservoirs, to the increasing demands of man.

"The ministry controls the amounts of water, in excess of 50,000 litres a day, drawn from every lake and river in the province. We have the power to say no, or to curtail the rate of withdrawal. Where, for instance, we have reason to believe that there will be a harmful effect on farming or fishing, we step in," Scott said.

Over the last decade Environ-

ment Ontario, in co-operation with other ministries and local conservation authorities, has taken the lead in developing water management plans for large river basins and nearshore areas. The main ones involve the Thames, Grand and Rideau rivers. The Thames Basin plan is now being implemented. The Grand River Water Management Study is well advanced. On the Rideau River, stormwater problems for the protection of recreational facilities are being solved.

Some of the most dramatic measures Ontario achieved have been the result of close collaboration with Canadian federal and American federal and state agencies. This is particularly so in respect to the shared waters of the Great Lakes and their tributaries.

"For Ontario's part, we will push ahead. We have been taking a leading role ever since the dawn of environmental consciousness and have no intention of letting up," Scott said. "We expect our partners across the border to contribute their fair share. We are not, and will not be in the future, the least bit hesitant in reminding them of what we consider a fair share to be."

New toxicology laboratory officially opened

At the official opening of Environment Ontario's new phyto-toxicology laboratory in Brampton, Doug Harper, head of toxicology laboratory; Rev. Bryon Nash of the Brampton Anglican parish; Graham W.S. Scott, Environment Ontario deputy minister and W.B. Drowley, executive director, Environment Ontario, examines a row of tobacco plants in an outside plot (see also story on pg. 4, 5).

Wanted: ideas on fuel from waste

A fund of \$200,000 has been allocated by the Ontario Ministries of the Environment and Energy to help companies or individuals with workable ideas on the conversion of garbage to energy, using the facilities or products of Environment Ontario's Experimental Plant for Resource Recovery in Downsview.

The experimental plant was built to explore opportunities for the development of new technology in the area of material and energy recovery from waste. Currently, materials that can be recycled are extracted from the waste. The remaining waste is processed and divided into paper and plastic components and heavier waste which also has energy value.

Proposals for funding should be based on use of this processed waste or on the installation of additional facilities within the plant to improve the efficiency of the energy and material recovery from waste.

The first such proposal funded by the government is at the Brampton Brick Plant. Brampton Brick will use the paper and plastic components of the processed waste (refuse-derived fuel) for the firing of bricks.

The scheme calls for the waste to be incorporated in the unfired bricks. During the firing cycle, the combustion point is reached, and the paper and plastic components provide an internal source of energy, thus reducing the amount

of purchased energy needed in the kiln. Brampton Brick has been allotted \$25,000 for the initial part of its proposal.

All proposals will be screened first by the Ontario Research Foundation in Mississauga. All feasible ideas will be forwarded to government technical staff from both ministries for a final decision on funding.

Terms of reference for the program are available from the Ontario Research Foundation.

Address inquiries and/or submissions to: Dr. Rob Laughlin or Mrs. Isobel Duncan, Ontario Research Foundation, Sheridan Park, Mississauga, L5K 1B3. Tel: (416) 822-4111 Ext. 210.

It's all one world...

Nitrate and ammonia may keep Earth cool

The flushing of sewage rich in nitrate and ammonia through rivers into the oceans will help slow the increase of carbon dioxide levels in our atmosphere and retard the onset of the "greenhouse effect," say researchers of the Oceanographic Science Division of the Brookhaven National Laboratory in the U.S.

The nitrates reach the seas in a form that allows their easy assimilation by marine life, especially plankton, which grows furiously in the shallow seas along the continental shelves.

The plankton also needs carbon and takes up this element from carbon dioxide dissolved in sea water. The plankton that has not been

consumed by other forms of marine life eventually dies and sinks to the ocean bottom, where it remains. The carbon-depleted seawater can take up additional carbon dioxide out of the atmosphere.

Rivers in the Northern Hemisphere have doubled and quadrupled their nitrogen content in the last ten to 20 years because of the increased use of fertilizers and because more treated sewage is entering them.

The content of phosphate of some rivers has increased up to tenfold in the past 50 years. The plankton, whose growth is now only limited by the amount of light falling on the oceans, should be able to absorb about 1.55 billion

tonnes of the 7.25 billion tonnes of carbon emitted yearly to the atmosphere.

About 5 million tonnes of this carbon originates from the burning of fossil fuels in industrialized

countries. Up to now scientists feared that the continuing destruction of tropical forests, one of the major sinks of atmospheric carbon dioxide, would lead to a gradual warming of the Earth's climate.

The Brookhaven oceanographers believe that plankton could take up most of the surplus carbon dioxide and thus keep the atmospheric content of carbon dioxide balanced.

Rivers are used over and over

The repeated use of water is widespread in industrial nations, according to a North Atlantic Treaty Organization study on drinking water issues.

The study, initiated in 1974, found that in Paris, for example, half of the water supplied to 2.3 million people has been used before, mostly by industries in the area. Within a 16-mile radius of

Paris, eight million people drink water consisting of 70 per cent treated effluents.

The potable water drawn out of the West German Ruhr River contained up to 40 per cent of treated wastewater, predominantly from domestic sources.

In England and Wales, 32 per cent of the potable water contains indirectly reused water drawn from

rivers supplying drinking water for about 16 million people.

The percentages are based on the total permitted volume of waste water or industrial effluents discharged upstream of a water intake and the gauged or estimated daily mean flow of the river.

The only effect on health was observed in the winter of 1959/60 when 7 per cent of the population of Essen, West Germany, suffered a nonbacterial gastroenteritis epidemic while the reuse rate of river water was 86 per cent because of damaged reservoirs.

In all reported cases the river water used was treated before it entered the municipal water distribution system.

Waste fuels brickwork

A brick manufacturer is Britain's first industrial plant to use biogas from a landfill site to replace some of the coal needed for its production.

A spokesman of the plant, London Brick in Stewarby, Bedfordshire, claims the new fuel will save the cost of hundreds of thousands of tonnes of low grade coal, although it replaces only about 20 per cent of the plant's energy need.

In digging out clay used for the production of bricks, the company has opened huge holes in the landscape. These holes are filled with household refuse from north London boroughs at a rate of about 1,100 tonnes per day.

The "tips"—as landfill sites are called in England—produce biogas consisting of about 50 per

cent methane. The gas is drawn off under low suction through pipes inserted through the clay cap covering the waste.

Toxic exports O.K.

Former U.S. president Carter's ban on the export of dangerous products has been reversed by President Reagan. Reagan noted that to enforce Carter's decree would have proven cumbersome and would have handicapped American exports. A new policy on dangerous products is not necessary because the president already has the power to ban the export of hazardous substances.

The British Government has promised action to stop imports of toxic wastes from continental Europe. Importers had discovered several loopholes in Britain's laws that allowed them to take advantage of the low charges levied in Britain for the disposal of toxic wastes.

Unlicensed storage tanks around Britain's shores now contain many thousand tonnes of toxic waste imported mainly from Holland. The imports were originally declared as toxic wastes "in transit" or as "stock in trade" and consist of

phenols, creosol, chlorophenols and other chlorinated organic materials of high toxicity.

Britain curbs waste imports

Acid rain...

(continued from pg. 1)

power plants near Cleveland.

On April 9, Ontario sought leave to intervene in the U.S. Court for Appeals for the District of Columbia in connection with petitions from the State of Ohio and two of its utilities. These petitions attempt to prevent EPA from considering Canadian environmental effects when reviewing state emission plans.

On May 28, Ontario petitioned the EPA to expand the scope of the hearings to consider international transport of pollutants.

\$30.5 mill for cleanup

Philadelphia is seeking \$30.5 million in cleanup costs in legal proceedings against 15 companies the city claims have dumped 14,000 barrels of hazardous waste in a city-owned landfill.

Red Sea protected

Seven countries bordering on the Red Sea have established an organization to protect the Red Sea's marine environment and to set up a centre to fight pollution.



Ministry
of the
Environment

Ontario

Hon. Keith C. Norton, Q.C.
Minister
Graham W.S. Scott, Q.C.,
Deputy Minister

Ohio fish better

The levels of PCBs and chlordane in fish in the Ohio River declined in 1980 below the 5 parts per billion guideline for PCB and 3 ppb guideline for chlordane, and some less tolerant species of fish are returning to the river, reports the Ohio River Valley Sanitation Commission. In 1979 one fourth of the fish tested exceeded the limits.

New outfall sewer for South Peel

Construction of a new outfall designed to discharge effluent from the South Peel Sewage System through a 1,700-meter-long, 8,800-mm-diameter pipeline into Lake Ontario 1,210 m offshore was announced by Environment Minister Keith C. Norton with the award of a \$3,484,000 construction contract.

"The existing 1050-mm-diameter outfall, serving a population of 89,000, is now operating at capacity," Norton said. "The new outfall will complement the system's new primary tanks and digestion facilities now nearing completion. It will also improve protection of the shore by diffusing effluent 800 meters further out in the lake and will permit continued growth in the western part of Mississauga to serve a future population of 375,000."

The concrete pipe sections will be lowered by crane into a trench pre-dug on the lake bottom and will be joined by underwater grouting.

Completion of the contract is scheduled for June, 1982. The construction contract has been awarded to Repac Construction & Materials Ltd. of Toronto. Con-

sulting engineers are Gore & Storie Ltd. Project manager is W.A.S. Marshall of Environment Ontario's project co-ordination branch.

The project is financed by the Regional Municipality of Peel and a 15 per cent Ontario Government subsidy.

"Crisis in the Rain"

Ontario Environment Minister Keith C. Norton has released a new 26-minute documentary movie, "Crisis in the Rain". The movie highlights the causes and damaging effects of sulphur and nitrogen emissions on both Ontario and northeastern U.S. lakes and rivers.

The film's message is: Ontario must have the co-operation and effective action of the U.S. to solve the acid rain problem.

The film is available in both, 16mm and 1/2 and 3/4 inch videotape format in Canada and the U.S. at no charge for showings to schools, colleges, and universities, conservation groups, civic and church groups. Requests should be made to:

Adelaide St. West, Toronto, Ontario M5V 1R6 (416) 362-2501.

—Modern Talking Pictures Ltd., 143 Sparks Ave., Willowdale, Ontario M2H 2S5 (416) 498-7293.

Sulfates travel

Seeking an explanation for high concentrations of ozone and sulfate in the midwestern and northeastern U.S., workers of the General Motors Research Laboratory found that the pollutants often travel in circles. The polluted air from these areas moves first to the Gulf of Mexico and returns after a complete circle to the area from which it originated.

16% contaminated

A total of 111 out of 670 wells tested throughout New Jersey are contaminated at some level by toxic organic chemicals, according to a three-year study conducted by the state Office on Cancer and Toxic Substances Research.

—Association Films Ltd. 333

Editor Robert Koci

Director of Information Services R.J. Frewin

28th Industrial Waste Conference

Chant: OWMC to subsidize Cayuga opponents

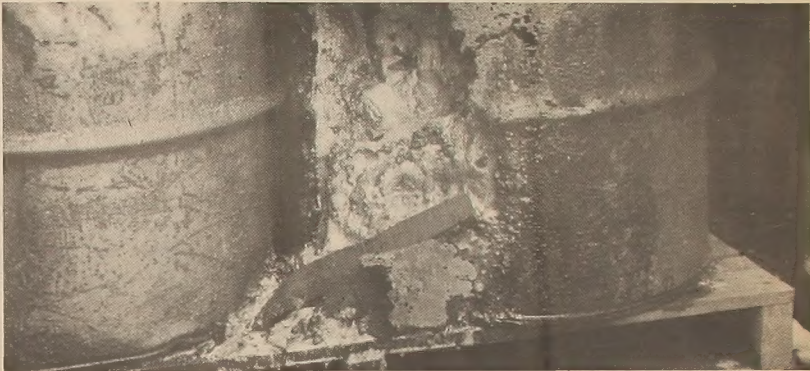
Problems surrounding the disposal of liquid waste dominated the 28th Ontario Industrial Waste Conference held in June in Toronto. The conference attracted experts from Canada and the United States.

Dr. Donald Chant, president of the Ontario Waste Management Corporation, announced that his agency will subsidize studies by experts selected by opponents of the proposed waste treatment facility at South Cayuga. The funds will be administered by the panel established to determine the safety of the facility.

South Cayuga will be only part of a system of regional collection and storage facilities, Chant said. At present, Ontario produces about 60 million gallons of liquid waste yearly in addition to waste processed and disposed of within industrial plants.

Of this amount, about 10 per cent is exported to the U.S. and 15 per cent is processed and disposed of at Tricil Ltd.'s waste disposal facilities near Sarnia. The remainder goes untreated either to landfill or storage and Ontario intends to end this method of disposal as soon as safe and efficient disposal facilities are established.

The Ontario Waste Management Corporation will be the final arbiter on industrial waste treatment. It may accept the suitability of the South Cayuga site, or it may reject the site even if the panel conducting the hearings on its safety approves it. It also may decide on a new site if South Cayuga is rejected.



This example of illegal and unacceptable storage/disposal of industrial waste was discovered by Environment Ontario officers. The case is now before the court.

The entrusting of industrial waste disposal to a Crown corporation has a number of advantages, Chant said. As a government agency, it can guarantee perpetual care of the facility, and can provide incineration, chemical treatment, fixation, biodegradation or any other suitable process, all or some of them not necessarily on the same site.

The hydrogeographic studies of the site now under way will take several months, Chant said. Pre-hearings on the site's safety can not be expected before the fall.

Hot-line informs about acid lakes

Information on the susceptibility of 1,665 Ontario lakes to acidification is now available through a telephone hot-line service established by Environment Ontario in June.

The service is based on an initial survey of lakes analyzed in Ontario's program of identification of waters affected by acid rain.

The hot-line provides up-to-date information on the status of specific lakes tested. Reports on

the status of 1,000 more lakes will become available later this summer.

The number to call for this information is:

(416) 248-3058

between 8:15 a.m. and 4:30 p.m. Collect calls are accepted.

Of the 1,665 lakes for which test results have been completed, 534 were listed as not sensitive, 567 as having moderate sensitivity, 244

as low sensitivity, 234 as extreme sensitivity and 86 as acidified. Almost all of the acidified lakes are in the Sudbury area.

Lakes are classified in five categories: acidified, extreme sensitivity, moderate sensitivity, low sensitivity and not sensitive.

"This survey represents just one element of our work on acid rain," Environment Minister Keith C. Norton said. "Future work will include an analysis of the data in a geological framework so that analysis of the sensitivity of other regions of the province can be undertaken."

"Apart from providing information to concerned cottagers and other citizens, this sampling program is part of the overall research study we are conducting to compile as much information as possible on the effects of acid rain."

"This type of scientific evidence is invaluable in our effort to increase the awareness of American citizens about the serious effects that U.S. emissions have in Ontario."

Lakes are arranged by county or district and listed alphabetically within each such division. For each lake, the location (township, latitude and longitude), the study or report providing the data, and the date of sampling are listed.

The report, Acid Sensitivity Survey of Lakes in Ontario, was produced as part of the Acidic Precipitation in Ontario Study.

In a preface, the report authors explain, "The five sensitivity categories are somewhat arbitrary since studies which can quantify the acidification rates of lakes of different buffering capacities are not yet complete."

"Nevertheless, they are based on current understanding of lake sensitivity and as such can provide a limited or preliminary answer to the question: Is my lake being affected by acid rain?"

A fact sheet which summarizes the report is available free of charge from: Information Services Branch, Ministry of the Environment, 135 St. Clair Ave. W., 6th Floor, Toronto, Ontario M4V 1P5. (416) 965-7117.

Transporters of liquid waste want standards

To attain a proper regulation of the transport of liquid industrial wastes the truckers of such wastes have recently established, with the support of Environment Ontario, an organization associated with the Ontario's Truckers Association.

The new organization's chairman, Alex Thomas, explained the needs of the new and rapidly growing industry consisting generally of former septic tank sewage transporters, at the Industrial Waste Conference.

Standards must be established for the waste that must be transported and for the equipment to transport it. These standards are now under development and indications are that the transport of hazardous waste will become even more stringently regulated.

These standards, their enforcement and the concurrent study of the best transport routes may become a valuable contribution to help overcome the "not in my backyard" syndrome, Thomas said.

R.B. Warren, general counsel for the Ontario Liquid Waste Carriers Association, said the existing split in responsibility for regulating the transport of hazardous wastes between the Ontario Ministries of Transportation and Communications and of the Environment results in gaps and conflicts in interpretation, application and enforcement of these regulations. He suggested that the full responsibility for the regulation of hazardous transports be transferred to the

Ministry of the Environment.

Warren also proposed a separate licensing system to cover the transport of waste including the transport of sewage, flammable, hazardous and toxic wastes. The

drivers of such transports should also be trained to handle the material safely and to handle spills.

The code, providing for severe penalties for non-compliance, should not be designed to keep

competition out of the business but to make sure that anybody involved in such transport knows what he is doing and does it properly with full regard for the safety of society and of the environment.

Risk assessment institute needed

One session was devoted to the controversial and still new science of risk assessment.

Only 10 years ago, scientific risk assessment was practically unknown. Professor Anne V. Whyte of the Institute of Environmental Studies at the University of Toronto said. Today the necessity to find ways to determine risk, hazards and potential hazards has found wide support, specially in connection with the handling and disposal of dangerous materials.

A major problem in the assessment of risks is the separation of facts from the noise they create in the public.

Another problem is that the ability of scientific technology to detect potentially hazardous materials in the parts per trillion range far outstrips man's ability to control such a contamination.

The search for the best way to assess a risk is on, and it does not mean that one must accept only a zero-risk situation.

Whyte suggested the formation

of a risk assessment institute as a scientific body that would take the function of risk assessment out of the emotionally laden political arena and place it on a scientific footing.

Dr. Nancy Kim, director of the Bureau of Toxic Substances Management, Albany, N.Y., dealt with the difficulties encountered in the establishment of scientific health risk guidelines.

Both, Kim and Dr. George Becking, chief of the Environmental and Occupational Toxicology, Health and Welfare Canada, established that there is at present no satisfactory scientific way to establish health guidelines for many toxic materials.

There is, Becking said, no valid model for the evaluation of carcinogenicity of a material as long as medical science is ignorant of the mechanics of cancer.

Tom Fowle, president of Simcoe Engineering Ltd., dealt with misconceptions about industrial

waste processing existing in the public mind.

Industrial waste does not consist of toxic concoctions, he said. It consists of materials that can be readily found in their raw form in any industrial neighborhood. The chemical properties of these materials are generally used up in the manufacturing process and the waste itself is much less dangerous than the original raw material.

In talking about industrial waste disposal facilities, Fowle said, the public fears some sinister works that would spew out deadly chemicals and noxious fumes and explode at the drop of a hat.

In reality, such a plant is a chemical plant like any other chemical plant like any other chemical plant manufacturing paints or medicines or plastics, with the exception that its operation would be subject to more stringent controls.

The big task of government and industry is to explain these facts credibly to the public and to restore public confidence.



Alan Kuja of the air resources branch explains the working of the controlled environment chamber to Shari Taylor and Dawn Brown.

New phytotoxicology adds dimension to m

A new capability and dimension were added to Environment Ontario's pollution abatement program with the opening in June of a new phytotoxicology laboratory at Brampton.

Phytotoxicology is the study of the effect of poisons on plants. By pinpointing damages caused by various pollutants to crops and trees, the ministry helps to protect agriculture and forest-based industries. Both are important parts of Ontario's economy.

"In the long run, plant damage by pollutants may well be a harbinger of the threat air pollution poses to man," Deputy Minister Graham W.S. Scott said at the of-

ficial opening.

Several health studies are now under way to determine the effects of air pollutants on humans. The ministry is funding a study on the effects of fluoride on residents living near a brick-making plant. Similar studies are under way by federal authorities on the effects of aluminum smelting.

The first clues for both these problems came from the study of vegetation damage.

"To our knowledge, this new research laboratory is the only comprehensive clean-air greenhouse and growth chamber facility in Canada," Scott said.

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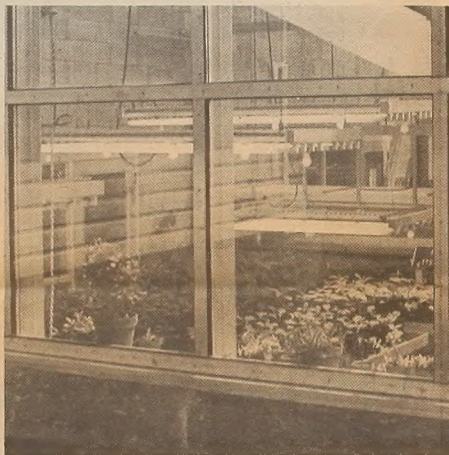
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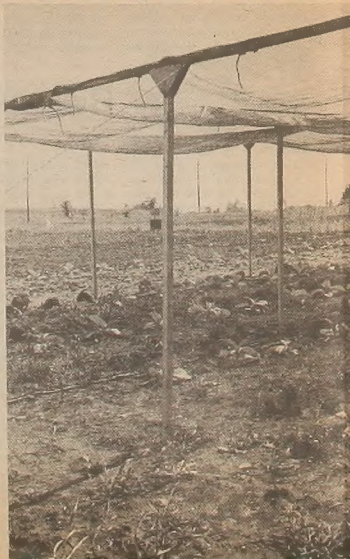
Other



A variety of plants is grown in the spacious hothouse under the care of Al



Doug Harper, head of the toxicology laboratory; Graham W.S. Scott, Environment Ontario Deputy Minister; Arch Deacon, Mayor of Brampton and J.C. Thatcher, Ministry of Government Services Deputy Minister, tour the new laboratory.



Doug Harper examines young plants in one of the outside

y laboratory ministry work

the air from which normally pre-impurities as sulphur dioxide, fine and others, have been re-

plants of various kinds, such as tobacco, soybeans and alfalfa, are grown in chambers into which various pollutants can be introduced either singly or in combination with others. Light, humidity and temperature can also be controlled.

Other plants are grown outside in various plots located near industrial sources to act as sentinels of pollution damage.

The results of these experiments are important for establishing air quality criteria and standards.

Other projects going on at the

laboratory involve the study of the effects of acid rain on crops and forests.

Scientists of the research section, headed by Dr. Sam Linzon, are also developing pollution-resistant plants and testing chemicals that could help prevent pollution damages. Manager of the plant is Doug Harper.

The new laboratory is located adjacent to the ministry's research centre in Brampton, used to evaluate new or modified sewage treatment methods and to train some 1,300 pollution control plant operators per year. Many are from other provinces and from outside Canada.



Natalie Liacas, architect with the Ministry of Government Services, designed the attractive and functional laboratory building.



Al Hill.

(photos: Treva Buchan)



de plots.



Al Hill, laboratory technician, takes care of tobacco plants that will be used in selected areas of the province as indicators of ozone concentrations.

'Clean air is no longer cheap'

Right up to the early 1960's we and our ancestors perpetrated environmental atrocities that seem incredible today. Environment Ontario Deputy Minister Graham W.S. Scott told the Ontario Lung Association annual meeting held in Toronto.

Pollution detection was at a fairly primitive state up to then. Pollution meant black smoke or an unbearable stench in the air.

Today many people are not aware that the things they take for granted — like clean air — simply were not available two decades ago.

"Since 1968, when the Ontario Government assumed responsibility for the maintenance and enhancement of air quality, industry in this province has spent or committed more than \$1 billion for air pollution abatement — clean air is no longer cheap," Scott said.

"Some of the \$1 billion investment was made voluntarily, out of a corporate sense of good citizenship. Much of it was not."

Ontario is World leader

Since 1968 Ontario's pioneering commitment to environmental protection has led to research, legislation and policies which have made the province a recognized world leader in the environmental field.

To continue this record of achievement, the ministry has set four major long-term objectives:

- To control contaminant emissions.
- To establish environmental safeguards to protect human health and the natural environment.
- To manage Ontario's water resources and to manage waste.
- To develop and maintain measures to restore and enhance the natural environment.

To control air quality, Environment Ontario has promulgated regulations and established standards and desirable criteria for more than 100 contaminants. Ontario air quality standards for several pollutants, including sulphur dioxide, ozone, and suspended particulate matter, are much more stringent than those in other jurisdictions, such as the U.S. Ontario's air quality standards for emissions from industries have been adopted by other air pollution control agencies in Canada.

Environment Ontario now operates about 1,200 air quality monitoring instruments across the province which measure 30 common known contaminants and a wide range of other contaminants in special studies. A unique mobile air monitoring unit (TAGA 3000) provides instant, on-the-spot analysis of air quality. This extends the capability of the ministry's two other sophisticated mobile monitoring units. Plans are under way to equip each of the ministry's six regions in the province with a mobile monitoring unit to allow a quick response to emergencies.

Air monitoring equipment originally in place to measure suspended air particulate matter is now used to gather information on

several chemicals in the air. The suspended particulate matter from hundreds of stations across the province is now routinely analyzed for metals and organic compounds.

Tapes from the small units used to measure haze are now being analyzed to provide hour-by-hour data on the levels of specific metals (such as lead) in air.

An important aspect of Ontario's air management program is its Air Pollution Index and Alert System, established to give warning, and to prevent the adverse effects of air pollution build-ups. The network covers Toronto, Sarnia, Hamilton, Windsor, St. Catharines, Niagara Falls, Sudbury and Coniston.

The index is based upon continuous measurements of sulphur dioxide and suspended particulate matter. Readings below 32 have little or no effect upon human health. At 38, people with chronic respiratory disease may be affected. At 100, prolonged conditions would have mild effects upon healthy people and serious effects upon those suffering from severe cardiac and respiratory diseases.

Since the inception of the API, the number of occasions at which the index exceeded 32 has dropped in Toronto from 19 times in 1972 to twice in 1979. In Windsor the number of occasions exceeding 32 decreased from 9 in 1972 to once in 1979 and in Sudbury where the 32 level was exceeded 26 times in 1971, there have been 0 incidents since 1974.

Since 1970 the levels of sulphur dioxide in downtown Toronto have been reduced by approximately 90 per cent — from an annual average of 0.071 parts per million in 1970 to 0.008 ppm in 1979. Carbon monoxide decreased by 40 per cent. Suspended particulate levels have dropped 50 per cent in Toronto, and have been lowered in most communities by 50 per cent and more, Scott said.

marked improvements

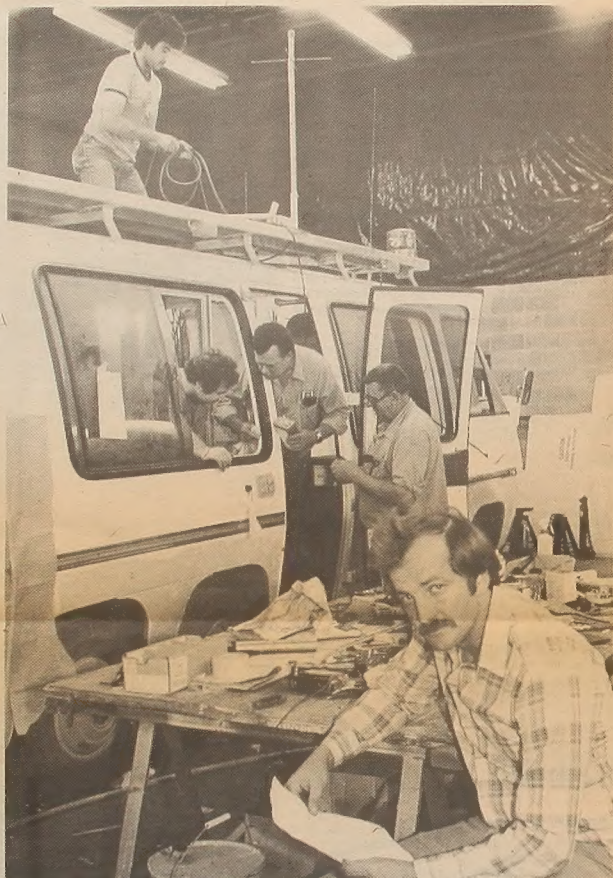
The air quality improvement was achieved mainly by the abatement of emissions. For example SO₂ emissions in Metro Toronto decreased from 227,000 tons in 1972 to 153,000 tons in 1978.

The air quality in other industrial cities such as Hamilton, Sudbury, Windsor, Sarnia, Welland, St. Catharines and Cornwall has also improved markedly since 1970.

The Ontario Ministry of the Environment is the only ministry in Canada which has legislation to control automotive pollution. In the auto emission spot check inspection program Environment Ontario inspectors analyze exhaust gases and inspect engines on approximately 8,000 cars a year. About 450 violation notices are issued yearly. Drivers or owners of cars with faulty emission systems are given three weeks to remedy the problem.

The automotive testing is done at the ministry's permanent test facility in Toronto or from one of the ministry's mobile monitoring units. Staff also visit used car lots to inspect cars for the removal of emission control devices.

Environment Ontario is the only agency in Canada with a comprehensive phytotoxicology pro-



A truck is being converted into one of the new mobile air monitoring units at the shop of Vehicle Conversions Inc., in Toronto. In the foreground, Ronald Bell, senior project scientist with Environment Ontario's air resources branch. On

top of the van Mario Carabott, Experience '81 student employed by the ministry. Helen Gohar, Marcel Scorpura and Stephen Barabash are Vehicle Conversion mechanics.

(Photo: Tessa Beetham)

gram equipped to investigate air pollution injury to vegetation, including forests, orchards, field crops and ornamental plants.

Staff phytotoxicologists can claim a number of achievements including:

- The first documented observations of arsenic injury on vegetation caused by airborne arsenic emitted from gold smelters in Northwestern Ontario. Pollution control equipment installed by the industries has eliminated arsenic injury in the area since 1976.
- The first documented observations of peroxyacetyl nitrate (PAN), — a type injury on vegetation in Canada, PAN, along with ozone, are photochemical oxidants formed during chemical reactions in the atmosphere from primary pollutants, nitrogen oxides and reactive hydrocarbons. The primary pollutants originate mainly from auto exhausts in the United States.

Sensitive crops, such as tomato and lettuce, are adversely affected even after a brief exposure to PAN.

extensive crop damage

Staff of the phytotoxicology section have gained a world-wide reputation based on their knowledge of the effects of different air pollutants on vegetation and are frequently invited to present papers at international technical conferences.

In addition to acidic precipitation, the ministry is concerned with transboundary pollution consisting of various gases such as sulphur dioxide and photochemical oxidants. Ozone, one of the largest components of these oxidants, has caused extensive damage to crops in Southern Ontario. These include

white bean, potato, grape, cucumber, onion and tobacco. It is estimated that more than \$10 million is lost annually due to reductions in crop yields caused by atmospheric ozone.

The ministry's overall acid rain program has already proven without a doubt that in addition to carrying out local abatement programs, we must seek international co-operation in improving the quality of our air.

While pressing our American neighbors to reduce their emissions of sulphur dioxide and oxides of nitrogen, and to live within the limits laid down in their own environmental laws, we have demonstrated that we are taking substantial steps to reduce emissions in Ontario.

"Our major challenge must now be to get strong abatement action from our friends in the United States so that together we can eliminate the threat of acid rain," Scott said.

MOE rewards creative enthusiasm

by Dawn Brown

For months the Gravenhurst area buzzed with creative enthusiasm as some 450 grade four and five students sketched, painted, and colored environmental-theme posters for Environment Ontario's Muskoka poster contest.

In reward for their efforts, 13 outstanding entrants were invited to participate in an Environmental Work Day in June organized by Environment Ontario's Muskoka-Haliburton district office in Gravenhurst.

Surprise showers did not dampen the students' enthusiasm and excitement. They munched on donuts and chattered incessantly while awaiting their departure from the Gravenhurst office to the many environmental adventures in store for them.

The first stop was the Gravenhurst Sewage Treatment Plant.

Here, environmental officer Dan Alleway, explained how 450,000 gallons of sewage was treated daily. The instruction continued with a tour of the facilities followed by a trip to the Gravenhurst Water Works.

The Muskoka Sands Inn, a resort on the shores of Lake Muskoka, provided a picturesque setting for lunch and the awards presentation.

Dennis Caplice, director of Central Region, congratulated each winner and presented certificates of merit. Then it was off to the docks where ministry boats were waiting.

Ministry water scientist Jan Beaver conducted the afternoon activities which included sampling lake water and sediments, examining algae and collecting zooplankton.

Environment Ontario has been organizing poster contests in Muskoka and Haliburton schools for the past six years. This year alone, Gravenhurst staff spoke to over 900 students in the area.

In May a similar contest was organized by the Sault Ste. Marie district office. Unlike the Gravenhurst contest, this contest was directed at high school students and, as a result, the posters submitted were of a much higher artistic calibre.

But regardless of the location, the purpose of the contests remain the same — to increase awareness of the environment and its problems.

"We prefer not to stress the competitive aspect too much," Gravenhurst district officer Frank Reinholz explained. "Our first priority is to promote environmental education in the schools."

Aeration controls manure spills

by Scott McCommon

A new method for limiting the impact of hog and cattle manure spills on fish and other aquatic life is now being developed by the southwest regional office of Environment Ontario in London. The method involves aeration of the water by a portable, gasoline-operated air blower which pumps air through a tube to form a curtain of bubbles.

Animal manure has a high ammonia content which is toxic and, when mixed with water, also reacts chemically to use up the oxygen in the water. This oxygen shortage suffocates the fish and other aquatic life. Manure passing through the curtain of bubbles is oxygenated and detoxified.

Animal manure is used extensively by farmers as fertilizer, but most farmers have limited storage

space for it. Sometimes excess manure is dumped either on land near the rivers or directly into the rivers. The manure then begins its path of destruction.

"Too many farmers don't know the toxic effects of manure," says southwestern regional director Doug McTavish. "So far, the ministry has attempted to stop spills by informing the farmers of the toxic effects and by imposing stiff fines. In the future, we hope to limit the impact of spills quickly and effectively with our portable aeration unit. Attempts will be made to identify the people responsible and to recover the costs of the investigative and aeration operations."

The aeration unit, stored at the London office, can also be used in dealing with effluents from industries and municipalities.



Environment Ontario water scientist, Jan Beaver, tests the oxygen content of a water sample from Lake Muskoka as three of the winners of Environment Ontario's Muskoka Poster Contest

look on. From left: Steve Rawn (Board of Education Trustee), Theresa Miller (Honey Harbour), Kim Smith (Gravenhurst), Heather Jewiss (Gravenhurst). (photos: Tony Barbas)



Six of 13 Environment Ontario Muskoka Poster Contest winners are instructed by environmental officer, Dan Alleway, at the Gravenhurst Sewage Treatment Plant. From left: Gary Roper

(Bracebridge), David Williamson (Bracebridge), Theresa Miller (Honey Harbour), Kim Smith (Gravenhurst), Heather Jewiss (Gravenhurst). Behind: Greg Morrow (Muskoka Falls).

Cattails are effective in sewage treatment

by Scott McCommon

Can cattails effectively treat sewage effluent? According to a year-long study by Environment Ontario on the Listowel experimental marsh, the cattail is as effective as a conventional sewage treatment plant in treating certain aspects of sewage effluent at a much lower cost.

"Listowel's marsh has been successful in reducing phosphorus levels in sewage effluent down to a level lower than that of a conventional sewage treatment plant,"

said Environment Minister Keith C. Norton.

Cattails use the nutrients found in sewage effluent in much the same way lawns use nutrients from manure and other fertilizers. With the cattails removing much of the nutrients from the effluent, watercourses can be kept free from an excessive build-up of aquatic plants and algae which cause large daily variations in life-sustaining dissolved oxygen levels. Dissolved oxygen is essential to any watercourse to support fish and

other aquatic life.

The experimental marsh was constructed for about \$300,000 and includes specialized equipment for monitoring treatment performance. Further studies are underway to establish the cost of an operational marsh system. This is determined largely by the volume of effluent treated and the size of the marsh area required.

"The findings so far suggest that the marsh approach to sewage treatment may be more feasible and less costly than mechanical or

other forms of treatment — especially to obtain satisfactory effluent quality — for discharges to small streams," said Doug McTavish, the ministry's southwestern regional director.

Cattails are dormant during the winter months and throughout last winter treatment was minimal. The marsh, however, was then at an early stage of development and further evaluations will be made next winter. Successful marsh operation for late fall/early winter would increase the cost effective-

ness of the system. An alternative is to store effluent during the winter to be treated during the spring and summer months.

Last summer, 10,000 cattails were planted in Listowel to treat part of the community's sewage effluent. Other forms of sewage treatment were found to be very expensive for this community of 5,000 people located 90 kilometres northeast of London and Environment Ontario scientific staff adopted the unique approach of using the hardy cattail to treat sewage effluent.



Cottage country open house

1250 learn about acid rain

by Liane Faulder

Although no reports cards were given out, the 1250 people attending Environment Ontario's acid rain open house at the Dorset Public School got an A for Awareness.

Environment Ontario staff were quizzed by local cottage owners and tourists, teachers and grandparents—all of whom expressed a vital interest in the issue of acid rain.

The open house, held the first weekend in July, featured displays

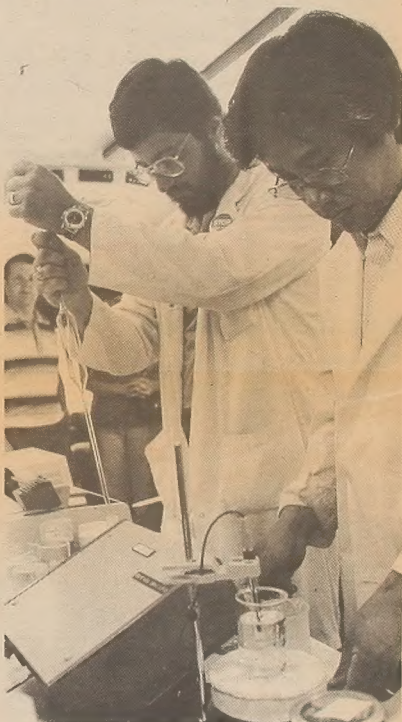
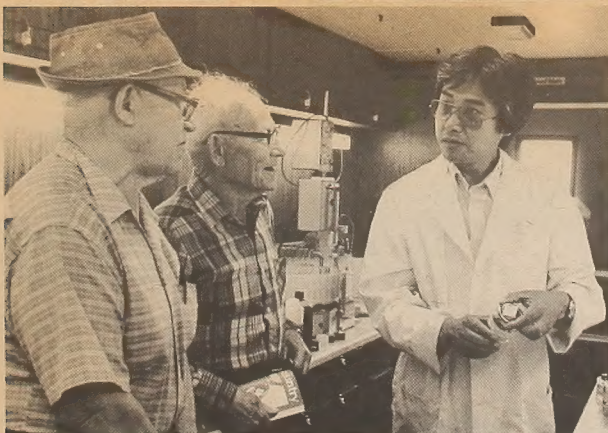
from both Environment Ontario and the Ministry of Natural Resources, describing the many sides of acid rain—its effects on soil and vegetation, and how fish populations are destroyed in affected lakes. Precipitation-collecting equipment used in the field and the new Environment Ontario film, *Crisis in the Rain* were shown.

But the highlight of the open house was Environment Ontario's brand new mobile aquatic testing

laboratory. Lab technicians were swamped with lake samples brought in by concerned cottagers for analysis and interpretation. Over 150 samples of lake and rain water were tested by scientists Frank Tomassini and Charlie Chun, and the results thoroughly explained. Most samples brought in were from within a 50-mile radius, but one gentleman brought a cup of rain all the way from Ohio. Rainwater collected from a mid-day shower in Dorset showed a pH

of 3.9, much more acidic than healthy rain.

Over 130 local residents and cottage owners also attended information meetings held on Thursday and Friday evening in Bracebridge and Haliburton. At these evenings, Environment Ontario's senior assistant deputy minister Walter Giles and ministry scientist Dr. Tom Brydges, answered numerous questions on the impact of acid rain and on the actions taken by the ministry to control it.



At Environment Ontario's open house in Dorset, Iain McInnis (age 2) displays his "Stop Acid Rain" button—In the new mobile aquatic testing laboratory, Keith Scheifele junior and senior place a pin on the chart of their lake—In another part of the mobile lab, Frank Tomassini and Charlie Chun test water samples brought in by visitors—The brothers Gordon and Orrie Avery talk about their lake with Charlie Chun.

(photos: Teresa Buchan)

Lake Ontario atlas documents water improvements

Gradual improvement of nearshore water quality is documented graphically in the first Lake Ontario Nearshore Water Quality Atlas released by Environment Ontario.

"The 42 colored charts of the atlas show a decrease in pollutants and generally an improvement in water quality in most nearshore areas of Lake Ontario during the years 1976 to 1979," said D.N. Jeffs, director of Environment Ontario's water resources branch. "A series of graphs based on the data collected since 1967 confirms

that this improvement is part of a long-range trend.

"In addition, the research has indicated some areas which require further activity and we are developing programs for the future."

Regular monitoring of nearshore water quality in Lake Ontario started in 1967. The data shown on the charts of the atlas, however, are based on sampling results from 1976 to 1979 after the introduction of an intensified sampling system.

In this system, samples are taken along depth contours of 4, 8, 12, 16, 32 and 50 metres at about 180

established stations in the area between the Niagara River mouth and Oshawa. In 1978 this sampling was extended to Amherst Island near Kingston.

Water sampling in offshore areas is done by the federal Departments of Environment and Fisheries and Oceans through the Canada Centre for Inland Waters in Burlington.

The sampling provides data on the levels of a number of pollutants and water quality indicators, such as phosphorus, nitrogen and nitrates, ammonia, silicate,

chlorophyll A, heterotrophic (carbon compound dependent) bacteria, water conductivity, temperature and Secchi disk readings. For each of these parameters separate charts showing their distribution in each of the years from 1976 to 1979 have been drawn.

All samples were taken in spring to take advantage of the relatively steady state of the water column.

"The atlas provides a good data base against which changes in nearshore water quality can be assessed in the future," Jeff said.

"They will also serve as a tool for the planners of developments along the lakeshore."

"In addition, the charts should be of interest to the 3.6 million Ontario residents who depend on the lake for their daily water supplies."

The atlas, in a durable plastic binder, is available for \$8 at the Ontario Government Bookstore, 880 Bay St., Toronto, or by mail from the Ontario Government Publication Centre, 880 Bay St., 5th floor, Toronto, M5S 1Z8.